

REMARKS

Claims 1-137 were pending in the application, of which claims 2-4 and 8-137 stand withdrawn from consideration in response to the restriction requirement dated November 20, 2008. The non-final office action dated April 23, 2009 rejects all other claims 1 and 5-7.

This paper amends claims 1 and 5-7 and cancels claims 2-4 and 8-137. Applicant is not conceding that the subject matter encompassed by claims 1-137 prior to this Amendment is not patentable. Claims 1 and 5-7 were amended, and claims 2-4 and 8-137 were canceled in this Amendment solely to facilitate expeditious prosecution of the application. Applicant respectfully reserves the right to pursue claims as presented prior to this Amendment, including the subject matter encompassed by claims 1-137, and additional claims in one or more continuing applications.

Claims 1 and 5-7 are now pending in the application.

Drawings

The Office Action objects to the drawings for various reasons, each of which is addressed in turn.

(1) The Office Action considers the drawings to be inaccurate and contradictory; specifically, “Figures 1A-1C do not correspond in almost any respect to Figures 2A-2B or 3A-3D”. Applicant respectfully disagrees; with the exception of noted inadvertencies and ambiguities (corrected herein by amendment), these Figures are not inaccurate and contradictory, but rather present different types of views of the same embodiment in varying levels of detail.

Figures 1A-1C are simplified side elevation cross-sectional views of one

embodiment of the multiple-isolation valve 10, which comprises an isolation valve 200 and an injection valve 300. A purpose of these Figures is to show the multiple-isolation valve 10 in three different positions: a load position, a transition position, and an injection position. In addition, these Figures show primarily the rotors 11, 61 and their fluidic connections, while omitting structure in order to simplify the illustration of these three different positions.

What appears in the cross-sectional views, however, depends upon where in the rotors their cross-sections are taken. The resulting sections can make it difficult to visualize their three-dimensional structure and rotary operation. To facilitate an understanding of their rotary operation, axes of rotations 200CL and 300CL have been added to Figures 1A, 1B, and 1C. Support for the axes of rotation can be found in Figure 2A, which shows the axis of rotation for the isolation valve 200, and in paragraph [0058], which teaches that the axes of rotation are parallel to each other. As described further below in connection with the § 112 rejection, the axes of rotation are parallel to, but not co-linear with the pin valves (see also Figures 2A and 2B of provisional application no. 60/550,930, which was incorporated by reference into the present application; these Figures were obtained from private PAIR, and for convenience sake, are attached to this paper).

Figures 2A-2B provide three-dimensional structure; not of the entire multiple-isolation valve 10 of Figures 1A-1C, but of the isolation valve 200 only. Although Figures 2A-2B show more structure of the isolation valve 200 than Figures 1A-1C, and in more detail, they are of the same embodiment. FIG. 2A shows a cross-section of the rotor 61; whereas FIG. 2B shows the rotor 61 as a three-dimensional cylindrical structure.

Figure 3A helps visualize the relative positioning of the isolation valve

200 with respect to the injection valve 300. Both valves 200, 300 are generally parallel to each other. Their axes of rotations 200CL and 300CL have also been added to Figure 3A to facilitate the understanding of their cooperation. The relative positioning of the isolation valve 200 with respect to the injection valve 300 in Figure 3A is the same as that shown in Figures 1A-1C. Figure 3A shows more structure of the isolation valve 200 than Figures 1A-1C, but again, they are of the same embodiment.

(2) The Office Action points out that the use of reference numerals 5 and 6 are used inconsistently across the Figures. Applicant has amended the Figure 2A to remove these numerals, which had pointed generally to the stators 202, 204 within which these pin valves 5, 6 respectively reside. Applicant submits that the amendment achieves consistent usage of these reference numerals throughout the Figures.

(3) The Office Action considers it difficult to understand how any sort of rotary motion of rotor 11 could produce the different positions shown. To facilitate an understanding of the operation, applicant has added axes of rotation to the Figure 1A. The rotor 11 has ports on its sides, which rotate with the rotor when the rotor turns about axis 300L (see Figure 2B of the provisional application) As an imperfect analogy, the ports are like finger holes of a rotary dial telephone; as the dial rotates, the holes move along the circumference of the dial. During the turn of the rotor, the pin valves 1, 2, 3, 4 momentarily move away from the rotor (allowing the rotor to turn), and then towards the rotor once the turn is completed. As a result, the port towards which each pin valve 1, 2, 3, 4 faces has changed.

(4) The Office Action points out that the use of reference numeral 101 is inconsistent across the Figures. Applicant has amended Figure 2B to remove

the inconsistent usage of this numeral.

In view of the above, applicant respectfully submit that the amendments to the drawings sufficiently address the objections raised by the Office Action.

Rejections under 35 U.S.C. § 112

The Office Action rejects claims 1 and 5-7 under 35 USC § 112, first paragraph, as failing to reply with the enablement requirement. According to the office action, the claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. Applicant respectfully disagrees.

Regarding the term “pin isolation valve” in the claims, this term corresponds to pin valves, such as valve pins 1, 2, 3, 4, 5, and 6 described in paragraphs such as [0037], [0038], and [0040], and such as isolation valve pins 1, 2, 3, 4, 5, and 6 described in paragraphs such as [0079] through [0086]. Applicant has amended the specification and the claims to use consistent terminology, calling such elements “pin valves”.

The Office Action notes that pin valves 5 and 6 in Figures 3C and 3D appear to be on the axis of rotation 200CL, and therefore suggests that pin valve 5 will always be connected to the fluid bore within the rotor 61, whereas pin valve 6 will always be aligned with a blank. Applicant respectfully submits that two factors induce this misunderstanding of Figures 3C and 3D:

(1) Although the pin valves 5 and 6 appear on the axis of rotation, they are actually parallel to the axis of rotation 200CL, but not co-linear with the axis. Figures 2A and 2B of the provisional application show this lack of co-linearity more clearly than the corresponding Figures of the present application. Figure 2A, for instance, clearly shows that the centerline is at the

edge of the leftmost opening, rather than at its center. Moreover, the centerline is spatially separated from the bores within the rotor 61, and not aligned with them. Less clearly, but nonetheless so, Figure 2B shows pin valve 6 to be off-center with respect to the rotor 61. Applicant has amended Figure 2A to reflect this off-center positioning of the pin valves with respect to the centerline based on the corresponding figure of the provisional application. Because the pin valves 5 and 6 are not co-linear with the axis of rotation, when the rotor 61 turns, the pin valves 5 and 6 no longer align with their respective bores in rotor 61.

(2) The cross-section slices the rotor 61 so that the viewed section starts from behind the bore within rotor 61 that connects to pin valve 6 (and so this bore does not appear in Figure 3D) and in front of the bore within rotor 61 that connects to pin valve 5 (and so this bore appears in Figure 3D). Thus, it is not that pin valve 6 is always connected to a blank, but that the bore to which it is in communication does not appear in the Figure.

With respect to the Examiner's comments regarding Figure 2B, granted, the structure shown in Figure 2B alone may not be sufficient to show all aspects of valve operation, but the disclosure in its entirety does. For example, Figures 1A, 1B, and 1C show three different structural pin valve-to-port positions, before and after rotation of the inject and isolate rotors. These figures clearly illustrate that the sides of the rotors have various physical ports, and that the rotation has resulted in a change of port location for the pin valves. The linear-sliding embodiment shown in Figures 8A and 8B buttress these teachings. When Figure 2B is viewed together with the teachings of the other Figures, such as Figures 1A, 1B, 1C, 8A, and 8B, it is evident that the surfaces on the sides of the cylindrical rotor 61, which are not drawn in Figure 2B, must have multiple ports that move (in rotary dial fashion) when the rotor

61 turns. And the turning of the rotor changes the port in front of a given pin valve.

In view of the above remarks and amendments to the drawings, applicant respectfully submits that the rejection is overcome and requests that it be withdrawn.

CONCLUSION

Applicant submits that this paper provides a response for all pending claims. Any absence of a reply to a specific rejection, issue, or comment, or to any taking of "official notice" or reliance on "common sense", however, does not signify agreement with or concession of that rejection, issue, comment, taking of "official notice", or reliance on "common sense". In addition, because the arguments made above are not exhaustive, there may be reasons for patentability of any or all pending claims that have not been expressed (for example, swearing behind one or more of the cited references).

In view of the amendments and arguments made herein, applicant submits that the application is in condition for allowance and requests early favorable action by the Examiner.

If the Examiner believes that a telephone conversation with the applicant's representative would expedite allowance of this application, the Examiner is cordially invited to call the undersigned at (508) 303-0932.

Respectfully submitted,

Date: September 23, 2009
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Attachment: Figures 2A and 2B of provisional application no. 60/550,930